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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)	
)	
Amendment of Parts 2 and 25 of the)	
Commission's Rules to Permit Operation)	
of NGSO FSS Systems Co-Frequency with)	
GSO and Terrestrial Systems in the)	
Ku-band Frequency Range)	ET Docket No. 98-206
)	RM-9147
and)	RM-9245
)	
Amendment of the Commission's Rules)	
to Authorize Subsidiary Terrestrial Use)	
of the 12.2-12.7 GHz Band by Direct)	
Broadcast Satellite Licensees and Their)	
Affiliates)	

MOTION FOR LEAVE TO FILE COMMENTS

Pegasus Communications Corp. ("Pegasus") hereby requests leave to file the attached comments regarding the proposed operations of Northpoint Technology ("Northpoint"). In October, Northpoint submitted to the Commission a technical report that it claims demonstrates that its proposed operations would not interfere with operations in the Direct Broadcast Service.^{1/} The focus of the Pegasus comments is on the critical flaws in the Northpoint tests.

^{1/} Northpoint Progress Report, Northpoint-DBS Compatibility Tests, Washington, D.C., October, 1999.

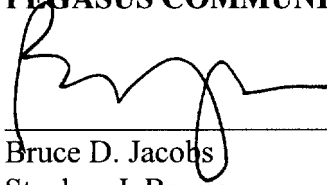
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Accordingly, Pegasus hereby respectfully requests that the Commission grant the instant motion and accept the attached "Comments of Pegasus Communications Corporation" for filing.

Respectfully submitted,

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December 29, 1999

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COMMENTS OF PEGASUS COMMUNICATIONS CORPORATION

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December 29, 1999

Summary

Pegasus Communications Corp. hereby joins other DBS providers in opposition to the proposal by Northpoint to put new terrestrial operations in the DBS band and thereby degrade the performance and competitiveness of DBS. There are approximately 10 million DBS dishes already in operation and that number is growing as DBS provides an attractive, high-quality multichannel video alternative to cable. Under these circumstances, the Commission should adhere to its long-standing policy of protecting DBS from terrestrial interference.

Northpoint's recent technical report is fatally flawed in several respects.

- Northpoint underestimates the susceptibility of DBS operations to interference, and as a result used measurement techniques that were not sensitive enough to measure carrier-to-interference ratios likely to result in interference to DBS.
- Northpoint's transmitter was located on a building 150 meters above ground, a height that is unlikely to be typical in many markets, particularly smaller ones.
- Northpoint's Rosslyn transmitter was mounted on the side of the building, thereby achieving especially favorable sidelobe and backlobe signal patterns.
- Northpoint did not take into account the fact that a substantial proportion of DBS receivers will lack any effective shielding, and did not account for the likely interference effects of reflected Northpoint signals.

The data that Northpoint does present in its Report actually supports the position that its operations would cause substantial interference to DBS. If Northpoint used appropriately sensitive measurement techniques and conducted its demonstrations under realistic conditions, even greater levels of interference would have been demonstrated. For instance, if an unshielded DBS terminal within the beam of a Northpoint transmitter were separated from that transmitter by only 0.1 kilometer, there would be harmful interference unless the Northpoint antenna was 94 meters or higher than the DBS receiver. DBS antennas operating to the north of the Northpoint

transmitter (with antenna beams passing near the Northpoint transmit antenna) might suffer particularly significant interference problems, and the resulting DBS exclusion area behind Northpoint transmitters mounted on buildings or hills could encompass a substantial population of DBS terminals nationwide.

Northpoint's proposal to mitigate any interference by modifying DBS users' equipment is impractical and unrealistic. Northpoint would put the burden on DBS consumers to identify the source of any problem and suffer the inconvenience of any mitigation. In order to continue to enjoy the high quality of reception that they have come to expect, DBS customers would have to permit Northpoint service personnel to climb on their rooftops, drill new holes in their houses, and run new wires through their homes. This would wreak havoc on millions of DBS customers and substantially reduce the appeal of DBS. Moreover, Northpoint now says it intends to provide a stand-alone multichannel video service, and as a direct competitor it will have no incentive to cooperate with DBS operators to minimize interference problems.

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COMMENTS OF PEGASUS COMMUNICATIONS CORPORATION

Pegasus Communications Corp. ("Pegasus") hereby joins DirecTV, Inc. ("DirecTV"), EchoStar Communications Corp. ("EchoStar"), and others in opposition to the proposed operations of Northpoint Technology ("Northpoint"), and comments on Northpoint's recent technical report, the "Northpoint Progress Report, Northpoint-DBS Compatibility Tests."^{1/} Pegasus agrees with DirecTV and EchoStar that Northpoint's proposed secondary operations would cause unacceptable interference to Direct Broadcast Service ("DBS"), substantially inconvenience many of the millions of existing DBS consumers, and deter many potential new DBS consumers from subscribing to what heretofore has been regarded as a high-quality service. A grant of Northpoint's proposal would thus put a brake on the development of DBS as an emerging alternative to cable for consumers in the multichannel video marketplace.

^{1/} Northpoint Progress Report, Northpoint-DBS Compatibility Tests, Washington, D.C., October, 1999 (the "*Report*").

Northpoint's recent interference tests were fatally flawed and cannot be used as evidence that its proposed terrestrial operations can coexist with DBS.

Background

Pegasus. Pegasus is one of the fastest growing media companies in the United States, as a provider of Direct Broadcast Satellite ("DBS"), television broadcasting, and cable services. In particular, Pegasus is the largest independent provider of DirecTV's DBS service in the Ku-band, with the exclusive right to distribute DirecTV programming services to approximately 4.9 million rural U.S. households. Pegasus serves more than approximately 720,000 DBS subscribers in thirty-eight states, and, including the effect of pending acquisitions, it will hold an overall 55% market share in its rural service areas. Pegasus' satellite service has grown quickly in the last two years, and Pegasus expects substantial additional growth in its residential subscriber base in the next few years.^{2/}

Northpoint and Its Washington, D.C. Demonstration. On March 6, 1999, Northpoint filed a Petition for Rulemaking with the Commission to permit secondary use of the 12.2-12.7 GHz DBS band by terrestrial systems that would transmit video programming and provide broadband data to DBS receivers.^{3/} Under Northpoint's proposal, its directional terrestrial antennas would transmit signals generally southward to northward-pointed dishes installed by Northpoint subscribers (although Northpoint's signals would propagate east and west also).

^{2/} Pegasus' subsidiary, Pegasus Development Corporation, is an applicant in the second Ka-band application processing round, seeking authority to launch and operate a global, geostationary Fixed-Satellite Service ("FSS") system. With its proposed Ka-band system, Pegasus plans to provide a broad range of multimedia services, consisting primarily of broadband, high-speed data transmissions.

^{3/} See Northpoint Technology Petition for Rulemaking to Modify Section 101.147(p) of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz band by Digital Broadcast Satellite Licensees and Their Affiliates, RM-9245 (March 6, 1998).

Northpoint claims that spectrum sharing with DBS operators is possible because DBS earth stations are pointed southward to receive signals from geostationary satellites. While Northpoint's Petition originally envisioned a service complementary to DBS, providing local signals in conjunction with the multichannel video programming provided by DBS operators, Northpoint now says it plans to itself offer a stand-alone multichannel video programming service (as well as Internet services) that would be directly competitive with DBS and cable services.^{4/} On November 24, 1998, the Commission issued the above-captioned Notice of Proposed Rulemaking, requesting comment on Northpoint's proposed operations in the Ku-band and asking for further technical analysis of the impact of those operations. In response, numerous parties, including DirecTV, EchoStar, and the Satellite Broadcasting and Communications Association, expressed their opposition to Northpoint's proposal.^{5/}

On March 12, 1999, a Northpoint affiliate filed an application for Special Temporary Authority to conduct tests and a demonstration of system performance in the Washington, D.C. area. After an initial grant and subsequent request for reconsideration from DirecTV and EchoStar, the Commission issued a revised, conditional STA to Northpoint. For its Washington, D.C. demonstration, Northpoint mounted a primary transmitter on the side of the USA Today

^{4/} See Sophia Collier, President and Chief Executive Officer, Northpoint Technology, Inc., Statement Before the House Commerce Subcommittee on Telecommunications, Trade and Consumer Protection at 1 (February 24, 1999).

^{5/} See Comments of DirecTV, Inc., ET Docket No. 98-206 (March 2, 1999) ("DirecTV Comments"); Comments of EchoStar Communications Corporation, ET Docket No. 98-206 (March 2, 1999) ("EchoStar Comments"); Comments of the Satellite Broadcasting and Communications Association, ET Docket No. 98-206 (March 2, 1999) ("SBCA Comments").

building in Rosslyn, Virginia, and also deployed a second transmitter within Washington D.C. in order to investigate the effects of the operation of multiple transmitters. Northpoint examined DBS performance at 29 sites in the Washington area, with all but 11 of those sites within one mile of the Rosslyn transmitter.^{6/} Northpoint's transmitter antenna gain was 10 dBi, horizontally polarized, with a vertical beamwidth of 17 degrees and a horizontal beamwidth of 110 degrees. At the DBS receiver sites, Northpoint measured Eb/No, bit-error rates ("BER"), and DBS signal quality (or Signal Strength Pointer, or ("SSP")). Following these demonstrations, Northpoint submitted its October 1999 "Northpoint Progress Report" to the Commission.

Discussion

I. Northpoint's Proposed Operations Are Inconsistent with Longstanding Commission Efforts to Protect DBS from Terrestrial Interference

Pegasus agrees fully with DirecTV, EchoStar, and other commenters in the Commission's pending rulemaking proceeding that Northpoint's proposed operations cannot coexist with DBS operations without causing unacceptable levels of interference and great inconvenience to those DBS customers.^{7/} Interference from Northpoint's signals would lower clear weather margins and substantially increase the frequency of downlink rain outages. In fact, prior testing by Northpoint has been either methodologically unsound or corroborative of the likelihood of such interference, and Pegasus concurs with DirecTV that Northpoint's technical analysis has demonstrated a complete lack of understanding of the complex technical issues

^{6/} *Report* at 4.

^{7/} *See, e.g.,* DirecTV Comments at 23-32; EchoStar Comments at 8-15.

associated with the effects of its terrestrial operations on DBS service.^{8/}

The risk of harm to millions of consumers who now receive their primary video services over DBS far outweighs any potential benefits from Northpoint's proposed system, which merely represents the repackaging of existing MMDS technology in the DBS service band. Northpoint no longer positions its service as a local-to-local complement to DBS, but instead emphasizes its role as a new standalone MVPD competitor. In addition, Northpoint has failed to provide any legitimate reason why it must use the 12 GHz DBS downlink band rather than other frequency bands that could be made available for its proposed secondary operations. Both the MDS and LMDS frequency bands have already been allocated for the types of services that Northpoint proposes, and other spectrum for such ubiquitous or high-density terrestrial service may also be available. New allocations in the DBS band are unnecessary, particularly when they present such a large risk of substantial interference to so many consumers.

Pegasus also agrees with DirecTV and EchoStar that Northpoint's proposal is fundamentally at odds with the Commission's commitment over the last twenty years to removing terrestrial sources of interference from the DBS downlink band.^{9/} Interference-free spectrum is crucial to the continuing development of DBS, which, in stark contrast to the wireless cable industry that Northpoint seeks to join, is now enjoyed by more than ten million subscribers. For millions of these Americans, in fact, DBS is the only available multichannel video service. In areas where cable service is available, a grant of authority to Northpoint would

^{8/} DirecTV Comments at 24-27.

^{9/} DirecTV Comments at 29-31; EchoStar Comments at 12-14.

actually decrease effective competition in the MVPD market by increasing interference to DBS.

Potential operators' continual desire to maximize use of spectrum has over the years led to numerous technical studies -- such as the one now presented by Northpoint -- regarding the potential coexistence of satellite and terrestrial operators in the same frequency band, and the Commission has repeatedly addressed the issue of spectrum sharing between satellite and terrestrial services. In particular, in the early 1980's the Commission concluded that most of the scattered terrestrial links then operating in the DBS band would have to be relocated outside that frequency band because these facilities could not coexist with ubiquitously deployed, blanket-licensed DBS receivers.^{10/}

In the fifteen plus years since the Commission established DBS, technology has developed, but the fundamental laws of logic and physics have remained the same. Widespread, simultaneous, co-frequency operations by satellite and terrestrial users can be achieved only through site-by-site coordination, and such coordination is simply not possible where one or both of those services are ubiquitous. The Commission emphatically reached exactly this conclusion in its 1998 order segmenting the 36.0-51.4 GHz frequency band between satellite and terrestrial operations. In that decision, the Commission specifically found that sharing between ubiquitous terrestrial wireless and satellite services in that band is not possible at this time without

^{10/} See, e.g., First Report and Order, Establishment of a Spectrum Utilization Policy for the Fixed and Mobile Services' Use of Certain Bands Between 947 MHz and 40 GHz, 48 FR 50722 (1983); Memorandum Opinion and Order, Regulatory Policy Regarding the Direct Broadcast Satellite Service, 94 FCC 2d 741 (1983); Inquiry into the Development of Regulatory Policy in Regard to Direct Broadcast Satellites for the Period Following the 1983 Regional Administrative Radio Conference, 90 FCC 2d 676 (1982).

significant technical constraints on both satellite and terrestrial system operations.^{11/} The Commission stated that current technology does not allow for such sharing and that it intended to provide the various proposed systems in the band “with the best opportunity to operate free of interference and encourag[e] commercial development of this band.”^{12/} The Commission made this finding *even though there are no FSS licensees yet in the 36.0-51.4 GHz band*, with FSS operations in this band years away, at a minimum. In its Ka-band proceeding, the Commission has made a similar finding regarding the need to separate terrestrial operations from ubiquitous satellite services.^{13/}

If current technology cannot permit sharing between ubiquitous satellite and terrestrial services that have not yet been deployed, it should be beyond argument that such technology will not allow a ubiquitous terrestrial service to be overlaid on top of an existing, ubiquitous satellite service such as DBS. Such action would seriously disrupt the service already being provided to

^{11/} Report and Order, In the Matter of Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations, IB Docket No. 97-95, 13 FCC Rcd 24649 (1998) (“*36-51 GHz Order*”).

^{12/} *36-51 GHz Order*, 13 FCC Rcd at 24659.

^{13/} See Notice of Proposed Rulemaking, Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, IB Docket No. 98-172, 13 FCC Rcd 19923, paras. 18-23 (1998) (finding that blanket licensing of ubiquitous FSS terminals would make it impractical for terrestrial fixed service providers to coordinate new operations to avoid interference in shared frequency bands).

millions of installed consumer DBS dishes, as well as to the more than 200,000 new DBS dishes that are being installed each month.^{14/}

II. The Results of Northpoint's Washington, D.C. Demonstration Are Invalid

A. Northpoint's recent demonstration was deeply flawed

The Commission should give no weight to Northpoint's claims that its recent Washington, D.C. demonstration shows that its terrestrial service can coexist with DBS operations without causing harmful interference to DBS service. From a technical perspective, this demonstration was fatally flawed. Northpoint underestimates the susceptibility of DBS operations to interference, and as a result used measurement techniques that were not sensitive enough to measure carrier-to-interference ratios likely to result in interference to DBS service. In addition, the conditions for this demonstration were unrepresentative, with Northpoint selecting technical parameters that were ideal for favorable results and ignoring the need to account for worst-case real-world conditions.

1. Northpoint underestimates the susceptibility of DBS operations to interference, and as a result used insufficiently sensitive measurement techniques

DBS customers currently enjoy excellent reception performance with 99.8% availability, benefitting from DBS link margins between 2.7 dB and 3.9 dB (somewhat higher in the southern U.S.). These margins, plus an excess margin to account for equipment degradation, have been

^{14/} As discussed further at page 15 *infra*, even if Northpoint could somehow demonstrate that it will not cause harmful interference to already installed DBS antennas -- which it has not done and in all probability cannot do -- Northpoint surely cannot establish that it will avoid interference to all future DBS antennas installed ubiquitously within DBS operators' service areas.

achieved by satellite operators and consumers at considerable expense, but the total available margins will decrease over time, as degradation occurs in both the DBS transmission systems and the subscriber equipment, including losses in TWTA power, increases in LNB noise, antenna misalignments, and antenna damage. As a result, loss of even a fraction of a decibel of margin is significant, and a secondary terrestrial wireless service that could severely impact the margin for many customers should not be permitted.

Given this need to protect DBS operations, Northpoint's threshold for unacceptable interference to DBS service is insufficiently stringent. DBS operators require an overall carrier-to-noise ratio ("CNR") (a figure that includes interfering signals) of no less than 5 dB; due to the use of heavy coding, existing DBS systems are sensitive to interference near this 5 dB threshold, and a 0.1 dB increase in this region can mean the difference between a picture with a bit error rate ("BER") of 10^{-9} and no detectable picture. In order not to disturb the operating parameters of the DBS system^{15/} -- which are achieved at a considerable expense to both the DBS operator and its subscribers -- Northpoint's system must show that its operations would result in a DBS carrier-to-interference ratio ("C/I") of greater than 30 dB in every reasonable circumstance. (A C/I of 25 dB means that interference does not contribute more than 1 percent to the overall downlink CNR of 5 dB.) At page 4 of its report, however, Northpoint states that a C/I of *4.8 dB* or lower from its operations would result in interference to DBS service. This figure is extraordinarily low. DBS customers would suffer unacceptable interference even at C/I ratios

^{15/} These parameters include cross-polarization performance, sidelobes, and uplink CNR. Together, these parameters represent a total C/I of 25 dB, which helps to reduce the cost of the still-expensive downlink.

significantly higher than that specified by Northpoint.

It is not surprising then that, given the unrealistic interference threshold it assumed, Northpoint's measurement procedures were methodologically inadequate. Northpoint based its interference analysis on its measurement of E_b/N_0 or other signal level parameters in the presence of the DBS signal. Such measurement techniques are not sensitive enough to detect all harmful interference to DBS systems. Northpoint should have measured received carrier levels or used similar methodologies that can accurately measure C/I ratios as high as 25 dB (resulting in no more than a 0.04 dB change in E_b/N_0).

2. The transmitter height was atypical

Northpoint located its transmitter on a building 150 meters above ground. Such height is ideal, and is intended to allow Northpoint's narrow vertical antenna beam to be effective close to the transmitter in minimizing interference to DBS service. It is unlikely, however, that Northpoint will be able to operate at such relative heights in all or even a substantial proportion of its target markets, due to zoning restrictions or other building availability issues. In addition, even if Northpoint is able to locate its transmitter on a similar building or tower in a given market, there are likely to be DBS receivers on the same or adjacent buildings as little as 10 meters below (as opposed to approximately 80 meters below in the Washington, D.C. demonstration). For field trials to be valid, Northpoint must test the effect of its transmissions on DBS service in more representative operational configurations, including in less than ideal installations where the Northpoint transmitter is at a much lower relative height and much more likely to be emitting into consumers' DBS terminals.

3. Northpoint's antenna orientation was unrepresentative

Northpoint mounted its transmitting antenna in a way that minimizes interference, placing it on the side of the Rosslyn building (because it caused harmful interference to DBS terminals when mounted on top of the building). The transmitting antenna sidelobe and backlobe patterns are affected substantially by the mounting arrangement, and by mounting its antenna on the side of this building, Northpoint obtained favorable sidelobe and backlobe patterns that will not occur in the case of more common installations, such as on communications towers, building rooftops, or hills. (In particular, by mounting its antenna on the side of the building, Northpoint was able to achieve the necessary isolation from two DBS receivers located on the same rooftop; however, Northpoint neglected to present any data for these DBS systems.) Since sidelobes at B40 dB are important to suppressing interference, Northpoint's transmitter's antenna pattern must be measured under typical mounting conditions, including worst-case, real-world conditions, so that achievable sidelobe isolation may be determined.

4. The DBS receivers appear to have been improperly unshielded

From Northpoint's report, it is not possible to determine the quality of the shielding of the DBS receivers used in the Rosslyn demonstration. (DBS antennas might be naturally shielded from a Northpoint signal by such obstacles as buildings, trees, or foliage.) While Northpoint cites a national survey that indicates that just fourteen percent of all DBS subscribers have unshielded antennas,^{16/} in Pegasus' view, a substantial percentage of all DBS antennas, perhaps

^{16/} See Report, Appendix IV at xxx. According to Northpoint, this survey indicates that 86 percent of DBS users "report there is something, either directly behind their dish or within 100 feet of the back of their dish, which shelters or shields their dish." Even if this claim were accurate (which Pegasus disputes), 14 percent of DBS users would have unshielded

as much as 50 percent, may not have effective shielding from the types of terrestrial transmitters being proposed by Northpoint. Many DBS antennas would be mounted on rooftops and on the ground, in addition to the sides of buildings. Moreover, the presence of obstacles up to 100 feet or more behind the DBS antenna will not guarantee that Northpoint transmissions will be obstructed because the obstacles may not be in the line of sight between the transmitter and the DBS antenna. Moreover, for DBS terminals close to the Northpoint transmitter, such natural shielding will not be adequate in any event.

Any legitimate measurement of the effects of Northpoint's operations on DBS service must account for real-world and worst-case conditions. To do so, Northpoint must make sure that the subject DBS receivers are unshielded and deployed in sufficiently large numbers in close proximity to the Northpoint transmitter under typical, real-world conditions. In any further testing, more care should be given to the selection of the locations of the test receivers.

5. The interference effects of reflected signals must be taken into account

Northpoint's demonstration also did not take into account the potential interference effects of reflected Northpoint signals. DBS receivers are often mounted directly onto buildings or on the ground in close proximity to large objects and structures, such as walls, roofs, standing pipes, and chimneys. While in all of its interference calculations Northpoint assumed that effective rejection of signals by sidelobes 40 dB less than the main beam, such nearby structures are likely to affect the sidelobes and backlobes of DBS antennas, reducing their interference rejection capability. Thus, actual measurements in a variety of reception environments,

antennas, meaning that more than a million subscribers would be highly vulnerable to interference from Northpoint's system.

including those with multiple signal reflections, would be needed to ascertain the likely amount of antenna isolation and resulting interference under real-world conditions.

B. An Appropriate Methodology Would Demonstrate That Northpoint's System Will Cause Harmful Interference to DBS Service Under Real-world Conditions

The data that Northpoint does present in its Report actually supports the view that its operations would cause substantial interference to DBS service. For example, Appendix III, Table III-3 of the Report lists significant power level changes (Northpoint off and on) for DirecTV DBS terminals: 1.5 dB for Normandy House rooftop, 1.3 dB for "Our Lady of Perpetual Help," 0.8 dB for Arlington Cemetery, and 0.9 dB for Banniker Drive. All of these power level changes are unacceptable, greatly exceeding the one percent threshold for tolerable reductions in DBS operators' needed CNR of 5 dB.

Moreover, if Northpoint used appropriately sensitive measurement techniques and conducted its demonstration under realistic conditions, even greater levels of interference would be shown. Below, Pegasus describes the likelihood of interference in three typical scenarios.^{17/}

Scenario 1: In Scenario 1, the Northpoint transmitter and the unshielded DBS terminal are separated by a distance of 1 kilometer, and this transmitter is assumed to be elevated 100 meters relative to the DBS terminal. Under these conditions, the unshielded DBS terminal would have a C/I of only 20 dB, and the Northpoint transmitter would have a vertical discrimination of only 1-2 dB. In the absence of shielding, therefore, each such DBS terminal would be subject to harmful interference.

^{17/} These calculations assume free-space conditions, Northpoint's stated antenna and transmitter performance, and the Commission's antenna standards, 47 C.F.R. ' 25.209.

Scenario 2: In Scenario 2, the Northpoint transmitter and the unshielded DBS terminal are separated by a distance of 0.1 kilometer. In this circumstance, an unshielded DBS terminal in the beam of a Northpoint transmitter will have a C/I of only 0 dB, and unless the Northpoint antenna is 94 meters higher than the DBS terminal, the DBS receiver will be subject to harmful interference.

Scenario 3: In Scenario 3, the DBS antenna is operating to the north of the Northpoint transmitter, with the DBS satellite in line with the Northpoint tower antenna. Such DBS receivers may suffer substantial interference problems. For example, assuming a 38 degree DBS terminal elevation angle the Northpoint transmitter would only be 192 meters away. Assuming 21 dB of isolation from the transmitting antenna vertical pattern, the C/I ratio will be -8.9 dB, preventing the DBS terminal from operating. An additional 45 dB of shielding would be required for a C/I \geq 30 dB; it is unlikely that a total isolation of 66 dB is achievable with Northpoint's broadbeam antenna. The resulting DBS exclusion area behind Northpoint transmitters mounted on buildings or hills could encompass a substantial population of DBS terminals nationwide.

III. Northpoint's Proposed Mitigation Should Be Rejected

Northpoint's Report states that "in the extremely rare case where" its secondary operations cause interference to a DBS subscriber's service, it will mitigate that interference by modifying, upgrading, or otherwise protecting any affected DBS customer's equipment, at its own expense. Specifically, Northpoint says that it will (i) reposition poorly pointed DBS antennas to eliminate pointing losses, (ii) replace the standard DBS antenna with one with better rejection characteristics, (iii) relocate DBS subscriber receivers away from line-of-sight of the

Northpoint transmitter, and (iv) install additional shielding to protect DBS customers.

Just as the Commission determined that mitigation techniques would not make spectrum sharing between terrestrial wireless and FSS services possible either in the 36.0-51.4 GHz band or the Ka-band, the Commission should reject as totally unacceptable the mitigation techniques suggested by Northpoint for the DBS band. As an initial matter, Northpoint's mitigation proposal makes the unreasonable assumption that Northpoint will be able to detect such harmful interference in the first place. Northpoint clearly lacks the capability to monitor such widespread interference, and the only way that Northpoint will become aware of specific cases of interference will be if DBS consumers inform their service providers regarding the resulting reception problems. In many instances, however, these consumers will neither know the cause of this poor performance nor ask their service provider to investigate, and they will either simply put up with a lower quality of service or switch to cable or some other multichannel video provider. Thus, Northpoint's mitigation proposal is a fundamentally flawed approach to resolving this interference.

Even where Northpoint learns of such interference and covers the expense of such activity, DBS subscribers would suffer the substantial inconvenience of having to replace existing equipment, move their equipment to an undesirable location, or put up with unattractive shielding, all in order to continue to enjoy the high quality of reception that they have come to expect. Moreover, such mitigation is unlikely to be a one-time event for DBS consumers; rather, Northpoint's proposed spectrum sharing would lead to chaos in the DBS band, with both Northpoint and DBS consumers having to make continual adjustments to their equipment in order to prevent interference to DBS operations. After an initial round of mitigation, additional

DBS antennas -- which, again, can be deployed ubiquitously -- would inevitably be installed in new locations close to a Northpoint transmitter. (As indicated above, more than 200,000 new DBS dishes are being installed each month nationwide.) To avoid interference to these new DBS antennas, Northpoint might have to relocate or re-point its transmitter. Such an adjustment might in turn lead to new interference problems for previously-deployed DBS antennas, and to avoid interference those existing DBS consumers might be required to make yet more changes and be subject to more inconvenience -- additional shielding or another relocation might be necessary. This chronic, ongoing process of remediation would threaten chaos and would be extremely frustrating for DBS consumers and service providers.

Thus, even if Northpoint covers the expense of such mitigation, its proposal would effectively place a substantial mitigation burden on DBS consumers, an outcome which is incompatible with Section 2.104 of the Commission's rules, which defines a secondary service as one which "[s]hall not cause harmful interference to stations of primary or permitted services to which frequencies are already assigned . . ." Proposed secondary operators such as Northpoint must themselves take all of the steps necessary to avoid harmful interference to primary services like DBS, and, if they fail to do so, they cannot be permitted to operate. Northpoint has been unable to present any legitimate evidence that it can avoid harmful interference to DBS customers' service, and its request for operational authority should be rejected.

Clearly, the mitigation proposed by Northpoint would substantially reduce the appeal of DBS and decrease its ability to compete in the marketplace. Many DBS customers might be driven to find alternatives to DBS. Moreover, Northpoint now says it intends to provide a stand-alone multichannel video service, and as a direct competitor it will have no incentive to

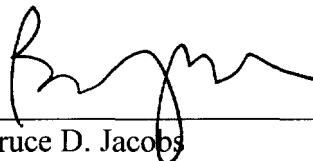
cooperate with DBS operators and consumers to minimize these interference problems.

Conclusion

For these reasons, Pegasus urges the Commission to dismiss the claims of Northpoint regarding its Washington, D.C. demonstration and deny Northpoint's request to operate its proposed terrestrial facilities in the 12.2-12.7 GHz band.

Respectfully submitted,

PEGASUS COMMUNICATIONS CORP.

A handwritten signature in black ink, appearing to read 'Bruce D. Jacobs', is written over a horizontal line.

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December 29, 1999

Technical Certification

I, John Kiesling, Consulting Engineer to Pegasus Communications Corporation, hereby certify the following under penalty of perjury.

I have reviewed the foregoing "Comments of Pegasus Communications Corporation," and the technical information contained in these Comments is true and correct to the best of my belief.


John Kiesling

Dated: December 29, 1999

CERTIFICATE OF SERVICE

I, Cindi Smith Rush, a secretary to the law firm of Fisher Wayland Cooper Leader & Zaragoza L.L.P., hereby certify that on this 30th day of December 1999, I served a true copy of the foregoing **"MOTION FOR LEAVE TO FILE COMMENTS and COMMENTS"** by first class United States Mail, postage prepaid, upon the following:

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